

Name: \_\_\_\_\_



Sacred Heart College

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# SCIENCE

2016

Level 2

**Achievement Standard 91190**

**Investigate how organisms survive in an extreme environment**

**Resource title: Organisms in Extreme Environments**

**Internal Assessment – 4 credits**

**Assessment resource**

**Due date:** Friday 24<sup>th</sup> June 2016

Conditions: you will research in homework or classroom time. You will write up the results of your investigations in class and homework time using the resources gathered. You may use notes from your investigations to do so.

The results of your research will be presented as a written report in which you will set and answer at least **three** different aspects of how **an organism** faces the survival challenges in **an extreme environment**.

You will need to identify

- What the environmental factor is and why it is a survival challenge for organisms in general (or for humans if that is your organism)
- In what way that survival challenge relates to the 'extreme' nature of the environment
- In what ways this environmental factor effects the organism, or humans if it is the human organism
- What technological (for humans) or biological adaptations help to overcome this survival challenge

## Internal Assessment Resource

**Achievement Standard Earth and Space Science 91190:** Investigate how organisms survive in an extreme environment

**Resource reference:** Earth and Space Science 2.4A

**Resource title:** Humans in Extreme Environments

**Credits:** 4

**Version:** 2

Achievement	Achievement with Merit	Achievement with Excellence
Investigate how organisms survive in an extreme environment.	Investigate in depth how organisms survive in an extreme environment.	Investigate comprehensively how organisms survive in an extreme environment.

### Student instructions

#### Introduction

This assessment activity requires you to investigate how organisms can survive extreme environments such as on very high mountains, humans in outer space, deserts, or in the deep ocean.

You must present the information you gather during your investigation and communicate it successfully to an audience of Year 12 students. You will communicate it through a written report unless another format is approved by the teacher. You should use diagrams, images, and data to illustrate relevant survival strategies or technology.

You must also hand in a logbook, workbook, and all of your rough notes and collected resources for assessment. You will be assessed on the depth and comprehensiveness of your investigation, which includes how well you have selected and processed the gathered information and how well you have justified how humans can survive in extreme environments in your presentation. You will not be assessed on how well you do the presentation.

#### Task

##### ***Part A: Select and process information***

You, your group, or teacher will choose the extreme environment and an organism that occurs naturally there, or an environment which is extreme for humans, such as space, high altitude, desert, or underwater.

Collect information for your investigation from a range of resources, such as class notes, the Internet, photographs, videos, DVDs, reference books, and interviews. You may collect and share information in groups or by yourself.

You should aim to select and process information on issues such as:

- the conditions of the extreme environment and how these would affect humans or other organisms
- why the conditions of the extreme environment require special biological features or technological modifications for survival
- how the technological modifications work together to allow humans to survive the conditions of the extreme environment
- reasons why the biological features or technological modifications allow humans or the organism you have chosen to survive the conditions of the extreme environment
- anything else that would be relevant to human or the organisms' survival, such as how humans might cope psychologically and how long they could stay in the extreme environment.

Refer to resource A for more detail on how to select and process information.

Keep all notes and copies of sources of information. These may be on paper or on a computer and they must be handed in with the final report/presentation. Do this by keeping:

- a logbook which records period by period progress on your information gathering
- a workbook which records in order which information you have selected to include. (This shows you processing the information.)
- rough notes and photocopied resources kept in chronological order in a folder.

## ***Part B: Prepare the report/presentation***

Using your processed information, prepare your report/presentation. In this you should:

- describe the conditions of the extreme environment that require special technology for human survival
- describe the technology required for human survival in this extreme environment
- explain how the technology works to allow humans to survive in this extreme environment
- explain and justify anything else that would be relevant to human survival, such as how humans might cope psychologically and how long they could stay in the extreme environment
- acknowledge all sources of information, including images, diagrams (not generated by you), and data. (Refer to resource B for more information on how to do this.)

It is very important that the final assessment is in your own words, as this shows that you have understood the work and have not just copied information from the sources.

## **Resources**

### ***Resource A: How to select and process information***

Selecting and processing information means choosing the particular information you need from the resources that you have gathered. You can show how you have selected and processed the information by:

- highlighting relevant information within the resources
- writing notes on relevant points
- making comments about the information, for example, whether it could be out of date
- putting useful information into your own words.

### ***Resource B: How to acknowledge sources in your report/presentation***

You should always record your sources of information, including images, diagrams (not generated by you), and data. This includes recording:

- full web addresses for internet sources
- full referencing of information from books and journals
- details of any interviews, such as time and date.

Get into the habit of doing this each time you find new information. This will save you time when you are preparing your report/presentation.

Acknowledgement of sources should be in the form of:

- footnoting or referencing within your text any diagrams, tables of data, images, information that you have directly quoted (quotes should only be one or two sentences long), and ideas that are not your own even if they are in your own words
- a bibliography giving full web addresses for internet sources, full referencing of information from books and journals, and details of interviews, such as times and dates.

All sources of information must be recorded in a traceable format, which means that someone else could go straight to where the information came from.

## Assessment schedule: Earth and Space Science 91190 Humans in Extreme Environments

Evidence/Judgements for Achievement	Evidence/Judgements for Achievement with Merit	Evidence/Judgements for Achievement with Excellence
<p>The student has produced a logbook, workbook, copies of sources of information, and a report/presentation in which they investigate how humans survive in an extreme environment.</p> <p>The student has:</p> <ul style="list-style-type: none"> <li>selected and processed information on: <ul style="list-style-type: none"> <li>the conditions of the extreme environment and how they affect humans</li> <li>the technological modifications needed for human survival.</li> </ul> </li> <li>used the processed information to: <ul style="list-style-type: none"> <li>describe why the conditions of the extreme environment require special technological modifications for survival</li> <li>describe how the technological modifications allow humans to survive in the extreme environment</li> </ul> </li> <li>recorded sources of information used in a traceable format.</li> </ul> <p>Examples</p> <p>Information is selected and processed on:</p> <ul style="list-style-type: none"> <li>the conditions of the extreme environment and how they affect humans <i>e.g. for outer space – lack of oxygen, zero gravity, radiation exposure, causing death, loss of bone density, mutations respectively</i></li> <li>the technological modifications needed for human survival <i>e.g. water and oxygen recyclers, radiation shields, power sources, resistance machines for exercise, food, waste disposal, space suits, communication.</i></li> <li>Evidence for processing will come from paper or electronic notes and copies showing: <ul style="list-style-type: none"> <li>relevant information highlighted</li> <li>notes and copies annotated</li> <li>information put into student's own words.</li> </ul> </li> <li>Sources of information are recorded in a traceable format by footnoting or referencing in the body of the text or in a bibliography.</li> </ul>	<p>The student has produced a logbook, workbook, copies of sources of information, and a report/presentation in which they investigate in depth how humans survive in an extreme environment.</p> <p>The student has:</p> <ul style="list-style-type: none"> <li>selected and processed information that provides links between conditions of the extreme environment and technological modifications</li> <li>selected and processed information on: <ul style="list-style-type: none"> <li>the conditions of the extreme environment and how they affect humans</li> <li>how the technological modifications would enable humans to survive the extreme environment</li> </ul> </li> <li>explained, using the processed information, how the technological modifications allow humans to survive the conditions of the extreme environment</li> <li>recorded sources of information used in a traceable format.</li> </ul> <p>Examples</p> <p>Information is selected and processed on:</p> <ul style="list-style-type: none"> <li>the conditions of the extreme environment and how they affect humans <i>e.g. for outer space – lack of oxygen, zero gravity, radiation exposure, causing death, loss of bone density, mutations respectively</i></li> <li>how the technological modifications would enable humans to survive the extreme environment. <i>e.g. how exercising on a resistance machine might help prevent bone loss</i></li> <li>Evidence for processing will come from paper or electronic notes and copies showing: <ul style="list-style-type: none"> <li>relevant information highlighted</li> <li>notes and copies annotated</li> <li>information put into student's own words.</li> </ul> </li> <li>Sources of information are recorded in a traceable format by footnoting, or referencing in the body of the text or in a bibliography.</li> </ul>	<p>The student has produced a logbook, workbook, copies of sources of information, and a report/presentation in which they investigate comprehensively how humans survive in an extreme environment.</p> <p>The student has:</p> <ul style="list-style-type: none"> <li>selected and processed information that provides <b>integrated links</b> between conditions of the extreme environment and technological modifications</li> <li>selected and processed information on: <ul style="list-style-type: none"> <li>the conditions of the extreme environment and how they affect humans</li> <li>how the technological modifications <b>work together</b> to ensure survival in the extreme environment</li> </ul> </li> <li><b>justified</b>, using the processed information, <b>by explaining in detail and analysing</b> how the technological modifications allow humans to survive the conditions of the extreme environment.</li> <li>recorded sources of information used in a traceable format.</li> </ul> <p>Examples</p> <p>Information is selected and processed on:</p> <ul style="list-style-type: none"> <li>the conditions of the extreme environment and how they affect humans <i>e.g. for outer space – lack of oxygen, zero gravity, radiation exposure, causing death, loss of bone density, mutations respectively</i></li> <li>how the technological modifications work together to ensure survival in the extreme environment.</li> <li><i>e.g. water and oxygen recyclers, radiation shields, power sources, resistance machines for exercise, food, waste disposal, space suits, communication working together to ensure the survival of the humans in a space craft</i></li> <li>Evidence for processing will come from paper or electronic notes and copies showing: <ul style="list-style-type: none"> <li>relevant information highlighted</li> <li>notes and copies annotated</li> <li>information put into student's own words.</li> </ul> </li> <li>Sources of information are recorded in a traceable format by footnoting or referencing in the body of the text or in a bibliography.</li> </ul>

